

**UNITED STATES DISTRICT COURT  
WESTERN DISTRICT OF TEXAS  
WACO DIVISION**

ARIGNA TECHNOLOGY LIMITED,

Plaintiff,

vs.

SAMSUNG ELECTRONICS CO., LTD.;  
SAMSUNG ELECTRONICS AMERICA,  
INC.; and APPLE INC.

Defendants.

Case No. 6:21-cv-943

JURY TRIAL DEMANDED

**COMPLAINT FOR PATENT INFRINGEMENT**

This is an action for patent infringement in which Arigna Technology Limited makes the following allegations against Defendants Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Apple Inc., each of whom is a manufacturer and/or distributor who, without authority, imports, makes, offers for sale and/or sells in the United States mobile devices and computers that infringe the Patents asserted in this matter.

**PARTIES**

**Arigna**

1. Plaintiff Arigna Technology Limited (“Plaintiff” or “Arigna”) is an Irish company conducting business at The Hyde Building, Carrickmines, Suite 23, Dublin 18, Ireland. Arigna owns a portfolio of patents that cover radio frequency amplifiers and circuits with applications in a wide variety of consumer electronics products, including smartphones and laptops, as well as power semiconductors for applications in the communications, automotive, industrial automation, and energy industries. Arigna is the owner of all rights, title, and interest in and to United States

Patent No. 6,603,343 (the “343 Patent”) and United States Patent No. 8,947,164 (the “164 Patent”).

**Samsung**

2. Defendant Samsung Electronics Co., Ltd. (“Samsung Electronics”) is a foreign corporation organized and existing under the laws of the Republic of Korea with its headquarters at 129 Samsung-Ro, Maetan-3dong, Yeongtong-gu, Suwon-si, Gyeonggi-do, South Korea. On information and belief, Samsung Electronics does business itself, or through its subsidiaries, affiliates, and agents, in the State of Texas and the Western District of Texas.

3. Defendant Samsung Electronics America, Inc. (“Samsung America”) is a corporation organized under the laws of the State of New York. Upon information and belief, Samsung America is a wholly owned subsidiary of Samsung Electronics. On information and belief, Samsung America has employees based in and does business across the State of Texas.

4. Samsung America maintains regular and established offices in the Western District of Texas, including at 12100 Samsung Blvd, Austin, Texas 78754; 3900 N. Capital of Texas Hwy, Austin, Texas; and 2800 Wells Branch Pkwy, Austin, Texas 78728.

5. Further, on information and belief, Samsung Electronics directs and controls the actions of Samsung America such that it too maintains regular and established offices in the Western District of Texas, including at 12100 Samsung Blvd, Austin, Texas 78754; 3900 N. Capital of Texas Hwy, Austin, Texas; and 2800 Wells Branch Pkwy, Austin, Texas 78728.

6. On information and belief, Samsung America’s employees in this District include senior electrical engineers with experience working on semiconductor devices,<sup>1</sup> including

---

<sup>1</sup> See, e.g., LinkedIn, *Staff Engineer at Samsung Austin R&D Center (SARC)* (accessed Sept. 9, 2021), available at: [https://www.linkedin.com/in/vinodkadur/?miniProfileUrn=urn%3Ali%3Afs\\_miniProfile%3AAC](https://www.linkedin.com/in/vinodkadur/?miniProfileUrn=urn%3Ali%3Afs_miniProfile%3AAC)

semiconductor products relevant to this action.<sup>2</sup> Additionally, Samsung's website lists numerous job openings in its Austin offices, including for hardware and electrical engineering roles. For example, Samsung America is seeking a "Staff Engineer - GPU RTL Power" to work on "high performance low power GPU and System IP development for our mobile SOC's."<sup>3</sup> Given the location of such Samsung employees in Austin, on information and belief, documents and witnesses relevant to this action are located in this District.

7. Samsung Electronics and Samsung America have and/or maintain authorized sellers and sales representatives that offer and sell products pertinent to this Complaint throughout the State of Texas, including this District and to consumers throughout this District, such as: AT&T Store at 4330 W Waco Drive, Waco, Texas 76710; Verizon Authorized Retailer at 2812 W Loop 340, Suite# H-12, Waco, Texas 76711; Best Buy at 4627 S Jack Kultgen Expy, Waco, Texas 76706; and Amazon.com.

8. On information and belief, Samsung Electronics and Samsung America also own and operate a manufacturing facility and the Samsung Austin Research Center in Austin, Texas.<sup>4</sup>

9. In addition, Samsung Electronics and Samsung America have placed or contributed to placing infringing products like the Samsung Galaxy S20 Ultra 5G into the stream of commerce via established distribution channels knowing or understanding that such products would be sold

---

[oAAAGSV1cBnM3Ja\\_oLUk26eny-VKqcYCnKUxU](#); LinkedIn, *Physical Design Engineer at Samsung Electronics* (accessed Sept. 9, 2021), available at: [https://www.linkedin.com/in/prithvikondur-9147bb40/?miniProfileUrn=urn%3Ali%3Afs\\_miniProfile%3AACoAAAipXmABDP0rh4sXK8TdMnh6Mu0ot1\\_H9AQ](https://www.linkedin.com/in/prithvikondur-9147bb40/?miniProfileUrn=urn%3Ali%3Afs_miniProfile%3AACoAAAipXmABDP0rh4sXK8TdMnh6Mu0ot1_H9AQ).

<sup>2</sup> See, e.g., LinkedIn, *Director at Samsung Electronics* (accessed Sept. 9, 2021), available at: [https://www.linkedin.com/in/matt-streyle/?miniProfileUrn=urn%3Ali%3Afs\\_miniProfile%3AACoAAAF-2OkBO5YUOpKlNd3nS5BjJE5quhRA9Qs](https://www.linkedin.com/in/matt-streyle/?miniProfileUrn=urn%3Ali%3Afs_miniProfile%3AACoAAAF-2OkBO5YUOpKlNd3nS5BjJE5quhRA9Qs).

<sup>3</sup> Samsung Electronics Careers, *Staff Engineer - GPU RTL Power* (accessed Sept. 9, 2021), available at: [https://sec.wd3.myworkdayjobs.com/en-US/Samsung\\_Careers/job/3900-N-Capital-of-Texas-Hwy-Austin-TX-USA/Staff-Engineer---GPU-RTL-Power\\_R31534](https://sec.wd3.myworkdayjobs.com/en-US/Samsung_Careers/job/3900-N-Capital-of-Texas-Hwy-Austin-TX-USA/Staff-Engineer---GPU-RTL-Power_R31534).

<sup>4</sup> Reuters, *Texas city to offer Samsung large property tax breaks to build \$17 bln chip plant* (Sept. 6, 2021), available at: <https://www.reuters.com/technology/texas-city-offer-samsung-large-property-tax-breaks-build-17-bln-chip-plant-2021-09-06/>.

and used in the United States, including in the Western District of Texas.

10. On information and belief, Samsung Electronics and Samsung America also have each derived substantial revenue from infringing acts in the Western District of Texas, including from the sale and use of infringing products like the Samsung Galaxy S20 Ultra 5G.

11. Defendant Samsung America merged with Samsung Telecommunications America LLC in January 2015. *Koninklijke KPN N.V. v. Samsung Telecommunications America LLC, et al.*, Case No. 2:14-cv-01165-JRG (E.D. Tex.) at Dkt. 34. Prior to that merger, Samsung Telecommunications America LLC was involved in the sales and distribution of Samsung-branded consumer electronics products in the United States.

12. On information and belief, Defendant Samsung America is liable for any act for which Samsung Telecommunications America LLC otherwise would be or would have been liable, including for any infringement alleged in this matter, and references herein to Samsung America should be understood to encompass such acts by Samsung Telecommunications America LLC.

13. This Complaint refers to Defendants Samsung Electronics and Samsung America collectively as “Samsung.” On information and belief, Samsung designs, manufactures, distributes, imports, offers for sale, and/or sells in the State of Texas and the Western District of Texas mobile devices and computers that infringe the Patents asserted in this matter.

#### **Apple**

14. Defendant Apple Inc. (“Apple”) is a corporation organized under the laws of the State of California with its headquarters at One Apple Park Way, Cupertino, California 95014. Apple imports, makes, markets, distributes, offers for sale, and sells mobile devices, computers, and components under the Apple brand name in the United States.

15. Apple maintains regular and established offices in this District, including at 6900

W. Parmer Lane, Austin, Texas and 12545 Riata Vista Circle, Austin, Texas.<sup>5</sup> Apple also owns and operates multiple retail stores in this District, including Apple stores in Austin and San Antonio.<sup>6</sup>

16. On information and belief, Apple has thousands of employees based in the Western District of Texas and does business in this District and across the State of Texas.<sup>7</sup> Apple's employees in Austin include Hardware Engineers,<sup>8</sup> Hardware Design Engineers,<sup>9</sup> and Hardware Design Verification Engineers.<sup>10</sup> Given the location of such Apple employees in Austin, on information and belief, documents and witnesses relevant to this action are located in this District.

17. Apple's website lists numerous job openings in its Austin offices, including for hardware engineering roles. For example, Apple has open positions in Austin for a "Silicon Validation Hardware Engineer – PCB CAD Layout" responsible for "circuit board design and layout,"<sup>11</sup> as well as a "Silicon Validation Hardware Engineer - Board Design" responsible for "circuit design, defining routing constraints, layout review and simulation" and "[p]ower and

---

<sup>5</sup> Apple, *Apple expands in Austin* (Nov. 20, 2019), available at <https://www.apple.com/newsroom/2019/11/apple-expands-in-austin/>

<sup>6</sup> Apple, *Find a store* (accessed Aug 30, 2021), available at <https://www.apple.com/retail/>

<sup>7</sup> *Id.*

<sup>8</sup> See, e.g., LinkedIn, *Hardware Engineer at Apple* (accessed Sept. 7, 2021), available at: [https://www.linkedin.com/in/rakesh-karmakar-94713113b/?miniProfileUrn=urn%3Ali%3Afs\\_miniProfile%3AACoAACIDOWcBVUjwDcr652z0ejpLVQQdzBLmsM4](https://www.linkedin.com/in/rakesh-karmakar-94713113b/?miniProfileUrn=urn%3Ali%3Afs_miniProfile%3AACoAACIDOWcBVUjwDcr652z0ejpLVQQdzBLmsM4).

<sup>9</sup> See, e.g., LinkedIn, *Hardware Design Engineer at Apple* (accessed Sept. 7, 2021), available at: [https://www.linkedin.com/in/sandhya-krishnakumar/?miniProfileUrn=urn%3Ali%3Afs\\_miniProfile%3AACoAAACEyx0QBPPGR\\_8S1LGGCcq5BUtFLMvmHfx0](https://www.linkedin.com/in/sandhya-krishnakumar/?miniProfileUrn=urn%3Ali%3Afs_miniProfile%3AACoAAACEyx0QBPPGR_8S1LGGCcq5BUtFLMvmHfx0).

<sup>10</sup> See, e.g., LinkedIn, *Hardware Design Verification Engineer at Apple* (accessed Sept. 7, 2021), available at: [https://www.linkedin.com/in/anand-saharan-41833485/?miniProfileUrn=urn%3Ali%3Afs\\_miniProfile%3AACoAABIGRFQBNeAsNiYgcVtOV-y8V8--mSPA9A](https://www.linkedin.com/in/anand-saharan-41833485/?miniProfileUrn=urn%3Ali%3Afs_miniProfile%3AACoAABIGRFQBNeAsNiYgcVtOV-y8V8--mSPA9A).

<sup>11</sup> Careers at Apple, *Silicon Validation Hardware Engineer - PCB CAD Layout* (accessed Sept. 7, 2021), available at: <https://jobs.apple.com/en-us/details/200226046/silicon-validation-hardware-engineer-pcb-cad-layout>.

signal integrity analysis.”<sup>12</sup>

18. Apple has placed or contributed to placing infringing products like the iPhone 12 into the stream of commerce via established distribution channels knowing or understanding that such products would be sold and used in the United States, including in the Western District of Texas. Apple also has derived substantial revenue from infringing acts in the Western District of Texas, including from the sale and use of infringing products like the iPhone 12.

19. On information and belief, Apple designs, manufactures, distributes, imports, offers for sale, and/or sells in the State of Texas and the Western District of Texas mobile devices and computers that infringe the Patents asserted in this matter.

### **JURISDICTION AND VENUE**

20. This is an action for patent infringement arising under the patent laws of the United States. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

21. This Court has personal jurisdiction over each Defendant because each Defendant conducts business in and has committed acts of patent infringement in this District, the State of Texas, and elsewhere in the United States and has established minimum contacts with this forum state such that the exercise of jurisdiction over each Defendant would not offend the traditional notions of fair play and substantial justice. Upon information and belief, each Defendant transacts substantial business with entities and individuals in the State of Texas and the Western District of Texas by, among other things, importing, offering to sell, distributing, and selling products that infringe the Asserted Patents, including the infringing mobile devices and computers that each Defendant purposefully directs into the State of Texas and this District as alleged herein, as well

---

<sup>12</sup> Careers at Apple, *Silicon Validation Hardware Engineer - Board Design* (accessed Sept. 7, 2021), available at: <https://jobs.apple.com/en-us/details/200069399/silicon-validation-hardware-engineer-board-design>.

as by providing service and support to customers in this District. Each Defendant places the accused mobile devices and computers into the stream of commerce via authorized and established distribution channels with the knowledge and expectation that they will be sold in the United States, including in the State of Texas and this District, and does not otherwise permit the sale of the accused products in the State of Texas, or in this District, outside of these established, authorized, and ratified distribution channels.

22. Venue is proper in this District pursuant to 28 U.S.C. §§ 1391(b)-(c) and 1400(b), because each Defendant either is a foreign corporation that is not a resident of the United States and is subject to personal jurisdiction in this District, and thus is subject to venue in any judicial district including this District; resides in this District; and/or has committed acts of infringement in this District and has a regular and established place of business in this District.

23. Each Defendant is subject to this Court's jurisdiction pursuant to due process and/or the Texas Long Arm Statute due at least to each Defendant's substantial business in the State of Texas and this District, including through its past infringing activities, because each Defendant regularly does and solicits business herein, and/or because each Defendant has engaged in persistent conduct and/or has derived substantial revenues from goods and services provided to customers in the State of Texas and this District.

#### **SINGLE ACTION**

24. This suit is commenced against Defendants pursuant to 35 U.S.C. § 299 in a single action because (a) a right to relief is asserted against Defendants jointly, severally, or in the alternative with respect to or arising out of the same transaction, occurrence, or series of transactions or occurrences relating to the making, using, importing into the United States, offering for sale, and/or selling of the same accused products or processes and (b) questions of fact common

to all Defendants will arise in the action.

25. Plaintiff is informed and believes, and on that basis alleges, that its right to relief arises out of the same transaction, occurrence, or series of transactions or occurrences relating to Defendants Samsung's and Apple's import, manufacture, offer for sale, and/or sale of the same accused products or processes, including because, as alleged below, each Defendant designs, manufactures, assembles, imports, offers for sale, and/or sells mobile devices and/or computers that incorporate the HG11-PG660-200 RF die semiconductor device.

### **THE ASSERTED PATENTS**

26. This complaint asserts causes of action for infringement of United States Patent No. 6,603,343 and United States Patent No. 8,947,164 (together, the "Asserted Patents"). The Asserted Patents are valid and enforceable United States Patents, the entire right, title, and interest to which Arigna owns by assignment.

27. The Asserted Patents relate to power semiconductor devices using high-frequency RF signals for use in mobile devices, including smartphones, tablets, and computers.

28. On August 5, 2003, the U.S. Patent and Trademark Office duly and legally issued the '343 Patent, which is entitled "Phase Correction Circuit for Transistor Using High-Frequency Signal." Plaintiff holds all rights and title to the '343 Patent, including the sole and exclusive right to bring a claim for its infringement. A true and correct copy of the '343 Patent is attached as **Exhibit A**.

29. The '343 Patent generally claims a phase correction circuit for a transistor using a high-frequency signal. The claimed phase correction circuit stabilizes a phase of an output signal of a transistor even if the transistor's gate potential is increased by a temperature increase or other factors.



30. To the extent applicable, Plaintiff has complied with 35 U.S.C. § 287(a) with respect to the '343 Patent.

31. On February 3, 2015, the U.S. Patent and Trademark Office duly and legally issued the '164 Patent, which is entitled "Integrated Technique for Enhanced Power Amplifier Forward Power Detection." Plaintiff holds all rights and title to the '164 Patent, including the sole and exclusive right to bring a claim for its infringement. A true and correct copy of the '164 Patent is attached as **Exhibit B**.

32. The '164 Patent generally claims a method for accurate power detection in power amplifiers at a low cost, and in which the power detector's design does not affect the design of the power amplifier.

33. To the extent applicable, Plaintiff has complied with 35 U.S.C. § 287(a) with respect to the '164 Patent.

34. Plaintiff owns all rights, title, and interest in and to the Asserted Patents and possesses all rights of recovery.

### **FACTUAL ALLEGATIONS**

35. As referred to in this Complaint, and consistent with 35 U.S.C. § 100(c), the "United States" means "the United States of America, its territories and possessions."

36. None of the Defendants has any right to practice the intellectual property protected by the Asserted Patents.

37. Each Defendant makes, uses, offers to sell, sells, and/or imports into the United States products made in accordance with the '343 Patent, including but not limited to the Samsung Galaxy S21 Ultra 5G, Samsung Galaxy S21+ 5G, Samsung Galaxy S21 5G, Samsung Galaxy S20+ 5G, Samsung Galaxy S20 Ultra 5G, Samsung Galaxy Note 20 Ultra 5G, Samsung Galaxy

Note 20 5G, Samsung Galaxy Tab S7 5G, Samsung Galaxy Z Fold2 5G, Samsung Galaxy A71 5G, Apple iPhone 12, Apple iPhone 12 Pro, Apple iPhone 12 Pro Max, and iPhone 12 Mini, in addition to other mobile devices and computers.

38. Each Defendant makes, uses, offers to sell, sells, and/or imports into the United States products made in accordance with the '164 Patent, including but not limited to the Samsung Galaxy S21 Ultra 5G, Samsung Galaxy S21+ 5G, Samsung Galaxy S21 5G, Samsung Galaxy S20+ 5G, Samsung Galaxy S20 5G, Samsung Galaxy S20 Ultra 5G, Apple iPhone 12, Apple iPhone 12 Pro, Apple iPhone 12 Pro Max, and Apple iPhone 12 Mini, in addition to other mobile devices and computers.

**COUNT ONE**  
**INFRINGEMENT OF U.S. PATENT NO. 6,603,343**

39. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

**Samsung**

40. Samsung has infringed and continues to infringe at least claim 1 of the '343 Patent in violation of 35 U.S.C. § 271, either literally or through the doctrine of equivalents, by making, using, selling, or offering for sale in the United States, and/or importing into the United States, without authorization, products that practice at least claim 1 of the '343 Patent. Samsung is liable for its infringement of the '343 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

41. More specifically, Samsung designs, manufactures, assembles, imports, offers for sale, and/or sells mobile devices and computers that incorporate the HG11-PG660-200 RF die semiconductor device, infringing at least independent claim 1 of the '343 Patent.

42. For example, the HG11-PG660-200 RF die is found inside the Qualcomm QTM525 mmWave antenna module. The QTM525 mmWave antenna module that includes the HG11-

PG660-200 RF die is designed to be included in smartphones.

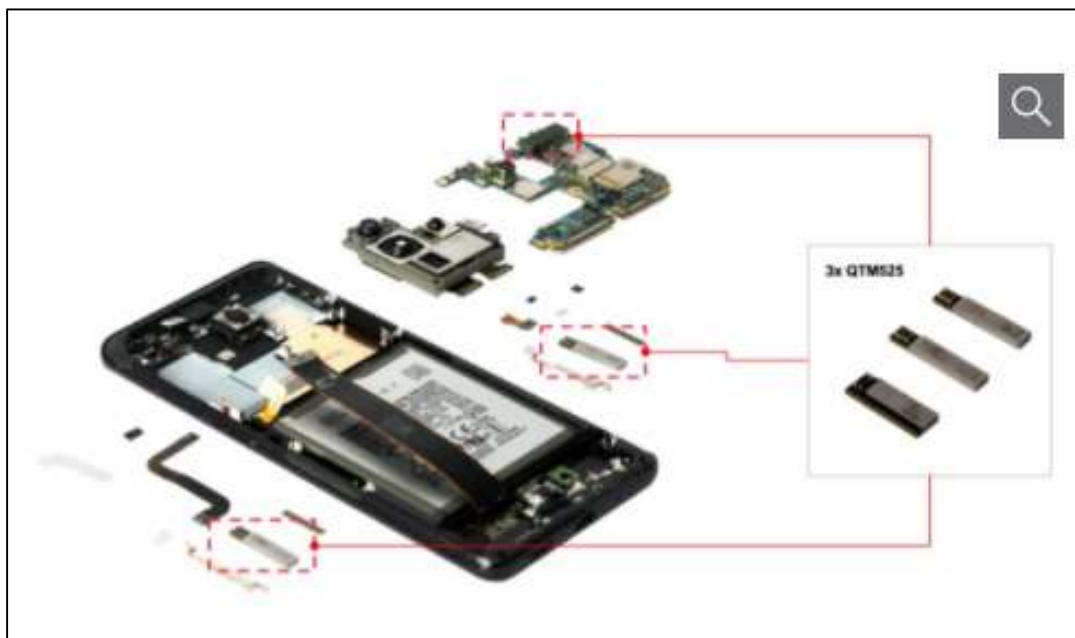
**FIGURE 1**



Source: Qualcomm, *Snapdragon X455 and 5G RF briefing slides* (Feb. 2019), available at: [https://www.t-mobile.com/content/dam/tfb/pdf/tfb-iot/Qualcomm\\_SD555\\_datasheet.pdf](https://www.t-mobile.com/content/dam/tfb/pdf/tfb-iot/Qualcomm_SD555_datasheet.pdf).

43. The QTM525 comes pre-installed in various Samsung devices including, for example, the Galaxy S20 Ultra.

**FIGURE 2**



Source: OMDIA, *Criticality of 5G Modem to RF Integration; A look inside Samsung Galaxy S20 Ultra* (Apr. 28, 2020) available at [https://omdia.tech.informa.com/-/media/tech/omdia/assetfamily/2020/04/28/criticality-of-5g-modem-to-rf-integration-a-look-inside-samsung-galaxy-s20-ultra/exported/criticality-of-5g-modem-to-rf-integration-a-look-inside-samsung-galaxy-s20-ultra-pdf.pdf?sc\\_lang=en](https://omdia.tech.informa.com/-/media/tech/omdia/assetfamily/2020/04/28/criticality-of-5g-modem-to-rf-integration-a-look-inside-samsung-galaxy-s20-ultra/exported/criticality-of-5g-modem-to-rf-integration-a-look-inside-samsung-galaxy-s20-ultra-pdf.pdf?sc_lang=en).

44. Claim 1 is illustrative of the '343 Patent. It recites “[a] phase correction circuit for a transistor, comprising: a circuit element having an output terminal connected to a gate of a transistor to which a control signal line is connected, and an input terminal, wherein the circuit element has a reactance that changes with potential difference between the input terminal and the output terminal; and a voltage control circuit supplying a voltage to the input terminal of the circuit element so that the reactance of the circuit element decreases in response to an increase in potential of the gate, wherein a sum of the reactance of the circuit element and a gate-source reactance of the transistor remains substantially constant.”

45. Devices with transceivers, antenna modules, front-end modules (FEMs), and/or other components which incorporate the HG11-PG660-200 RF die meet every element of this claim.<sup>13</sup> The HG11-PG660-200 RF die contains a phase correction circuit for a transistor. For example, the transmitter portion of the HG11-PG660-200 RF die contains transistors with a phase correction circuit. For instance, a circuit element in the HG11-PG660-200 RF die (hereafter called “MOS-C”) forms part of a phase correction circuitry for a transistor in the HG11-PG660-200 RF die (hereafter called “MOS7”).

46. This phase correction circuit contains a circuit element having an output terminal connected to a gate of a transistor to which a control signal line is connected. For example, in the HG11-PG660-200 RF die, the circuit element MOS-C has an output terminal connected to a gate of the MOS7 transistor. It also has an input terminal.

---

<sup>13</sup> This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which Samsung’s products infringe the '343 Patent.

47. A control signal line is also connected to the gate of the transistor. For example, a control signal line is connected to the gate of the MOS7 transistor through a passive bias network.

48. The circuit element has a reactance that changes with potential difference between the input terminal and the output terminal. For example, the identified MOS-C circuit element is an NMOS Field Effect Transistor whose source and drain are connected. MOS-C acts as a varactor whose capacitance (and thus reactance) changes according to the potential difference between the input terminal (drain and source node) and the output terminal (gate node).

49. This phase correction circuit in the HG11-PG660-200 RF die also contains a voltage control circuit supplying a voltage to the input terminal of the circuit element so that the reactance of the circuit element decreases in response to an increase in the potential of the gate. For example, another transistor in the HG11-PG660-200 RF die forms part of the voltage control circuit supplying a voltage to the input terminal of the circuit element MOS-C.

50. The reactance of the circuit element decreases in response to an increase in potential of the gate, wherein a sum of the reactance of the circuit element and a gate-source reactance of the transistor remains substantially constant. For example, when the magnitude of the gate-source potential at MOS7 increases, it leads to a reduction in the capacitance of the circuit element (MOS-C). As the gate potential of the MOS7 gets more negative (i.e., the magnitude of gate-source potential increases), the gate-source capacitance of transistor MOS7 increases. This increase is offset, however, by the decrease in the capacitance of the circuit element (MOS-C) that occurs due to the increase in the magnitude of the gate potential of MOS7 such that the sum of capacitance (i.e. reactance) of the circuit element (MOS-C) and transistor (MOS7) remains substantially constant.

51. Samsung makes, uses, imports, offers for sale, and/or sells mobile devices, such as

smartphones, that incorporate the HG11-PG660-200 RF die in their antenna modules, including but not limited to the Galaxy Samsung Galaxy S21 Ultra 5G, Samsung Galaxy S21+ 5G, Samsung Galaxy S21 5G, Samsung Galaxy S20+ 5G, Samsung Galaxy S20 Ultra 5G, Samsung Galaxy Note 20 Ultra 5G, Samsung Galaxy Note 20 5G, Samsung Galaxy Tab S7 5G, Samsung Galaxy Z Fold2 5G, and Samsung Galaxy A71 5G.

52. Samsung has imported and sold, and continues to sell and offer for sale, these mobile devices in the United States, including through Samsung websites (Samsung.com) and Samsung authorized retailers in the Western District of Texas.

53. Samsung committed and is committing the foregoing infringing activities without license from Arigna. Samsung's acts of infringement have damaged Arigna, as owner and assignee of the '343 Patent. Arigna is entitled to recover from Samsung the damages it has sustained as a result of Samsung's wrongful acts in an amount subject to proof at trial. Samsung's infringement of Arigna's rights under the '343 Patent is ongoing and will continue to damage Arigna.

54. Beginning no later than the filing of this Complaint, Samsung has had actual knowledge of the '343 Patent. Samsung's continued infringement following the filing of this Complaint, despite its knowledge of the '343 Patent and Arigna's infringement allegations, is intentional and deliberate and willful.

55. In addition, Samsung has indirectly infringed, and continues to indirectly infringe, the '343 Patent by actively inducing its infringement in violation 35 U.S.C. § 271(b).

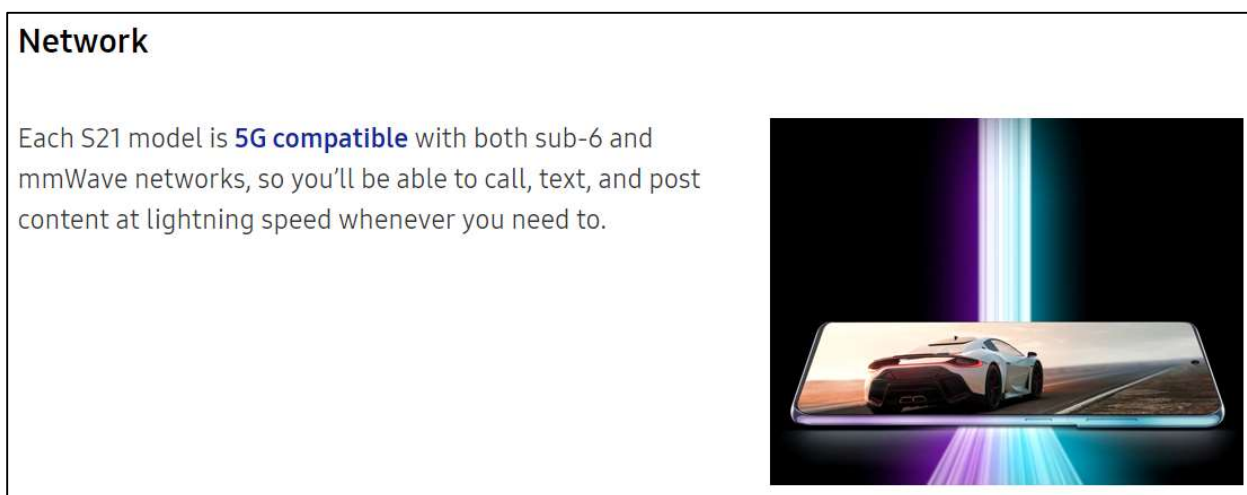
56. Samsung's authorized retailers, such as Best Buy, and wireless carriers, such as Verizon, directly infringe the '343 Patent by selling the accused Samsung devices to consumers. Consumers directly infringe the '343 Patent by using the accused Samsung devices.

57. Samsung knowingly induced and induces these acts of infringement with the

specific intent to encourage them. Samsung has taken and takes active steps to encourage and facilitate direct infringement by these third parties, in this District and elsewhere in the United States, through its manufacture and sale of the infringing products, and through its creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to the products with knowledge and specific intent that its efforts will result in the direct infringement of the '343 Patent by these third parties.

58. Such active steps include, for example, advertising and marketing the infringing products to resellers, wireless carriers, and consumers, obtaining FCC approval for such devices to be utilized in the United States, and distributing and selling such devices to consumers and resellers knowing that they would be marketed, offered for sale, and used in the United States. Samsung specifically advertises that the accused products are “5G compatible” and can utilize “mmWave networks, so you’ll be able to call, text, and post content at lightning speed whenever you need to.”

**FIGURE 3**



Source: Samsung, *Difference between Galaxy S21 models* (accessed Sept. 8, 2021), available at: <https://www.samsung.com/us/business/support/answer/ANS00088303/>.

59. Samsung’s website makes clear that consumers “don’t have to do anything to take

advantage of the increased speed and connectivity” of 5G when they are using the accused Samsung products, such as the Galaxy S21 5G or the Galaxy S21 Ultra 5G.<sup>14</sup>

60. Samsung user manuals for the accused products likewise facilitate infringement, instructing consumers about, among other things, how to “connect to mobile networks and use mobile data.”<sup>15</sup> By instructing third parties to turn on and use the infringing products for infringing purposes, such as to make and receive calls using the antenna modules, Samsung knowingly induces these third parties to commit infringing acts.

61. In addition, Samsung has indirectly infringed and continues to indirectly infringe the ’343 Patent as a contributory infringer in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, infringing products with knowledge that they are especially designed or adapted to operate in a manner that infringes the ’343 Patent and despite the fact that the infringing technology is not a staple article of commerce suitable for substantial non-infringing use. Samsung knowingly incorporates antenna modules with the HG11-PG660-200 RF die into the accused Samsung products such that they operate in an infringing manner. By incorporating such antenna modules into its products, Samsung contributes to infringing use as consumers make and receive calls using the antennas of the accused products, which lack substantially non-infringing uses because the accused products are designed and manufactured to operate as phones in a manner that infringes the ’343 Patent.

### **Apple**

62. Apple has infringed and continues to infringe at least claim 1 of the ’343 Patent in violation of 35 U.S.C. § 271, either literally or through the doctrine of equivalents, by making,

---

<sup>14</sup> Samsung, *Use 5G on Galaxy phones and tablets* (accessed Sept. 8, 2021), available at: [Use 5G on Galaxy phones and tablets \(samsung.com\)](https://www.samsung.com/us/support/faq/use-5g-on-galaxy-phones-and-tablets/).

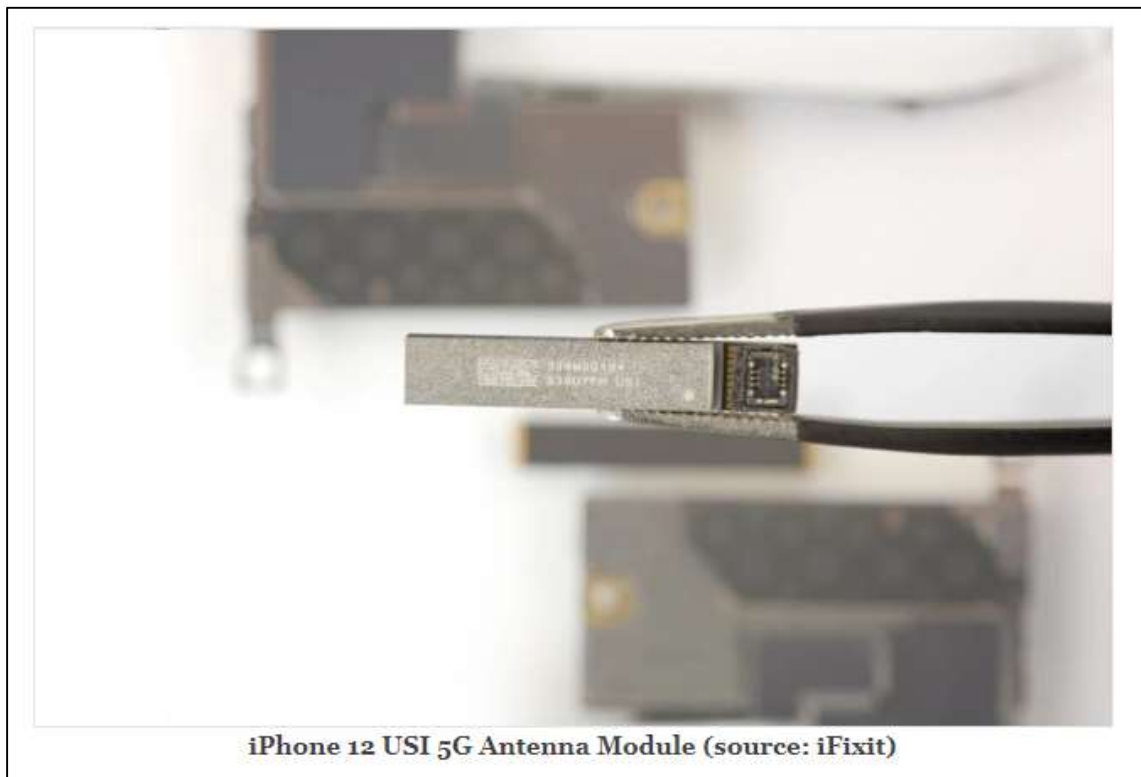
<sup>15</sup> Samsung Galaxy S21 5G User Manual.



using, selling, or offering for sale in the United States, and/or importing into the United States, without authorization, products that practice at least claim 1 of the '343 Patent. Apple is liable for its infringement of the '343 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

63. More specifically, Apple designs, manufactures, assembles, imports, offers for sale, and/or sells mobile devices that incorporate the HG11-PG660-200 RF die semiconductor device, which infringes at least independent claim 1 of the '343 Patent. For example, the HG11-PG660-200 RF die is found inside the Universal Scientific Industrial 339M00104 semiconductor device, which comes pre-installed in at least the Apple iPhone 12 Pro Max.

**FIGURE 4**

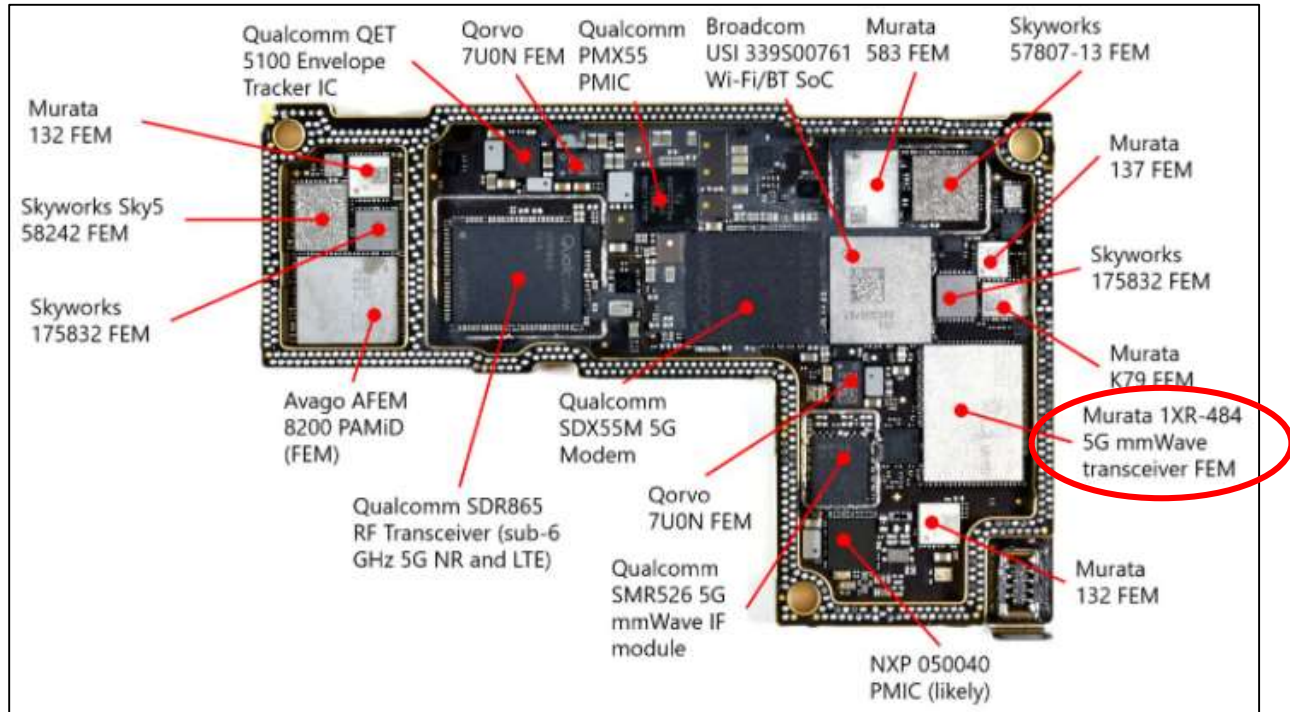


Source: EE Times, *5G iPhone: What's Apple's Next Step in RF, Antenna?* (Oct. 29, 2020), available at: <https://www.eetimes.com/5g-iphone-whats-apples-next-step-in-rf-antenna/#>

64. Likewise, the HG11-PG660-200 RF die is found inside the Qualcomm SMR525 semiconductor device, which comes pre-installed in at least the Apple iPhone 12 Pro. As another

example, and as shown in Figure 5, the HG11-PG660-200 RF die is found inside the Murata 1XR-484 front-end module, which comes pre-installed in at least the Apple iPhone 12 and iPhone 12 Pro Max.

**FIGURE 5**



Source: UnitedLex, *Apple iPhone 12 Pro Max Teardown Report* (accessed Sept. 6, 2021), available at: <https://unitedlex.com/insights/apple-iphone-12-pro-max-teardown-report>.

65. Claim 1 is illustrative of the '343 Patent. It recites “[a] phase correction circuit for a transistor, comprising: a circuit element having an output terminal connected to a gate of a transistor to which a control signal line is connected, and an input terminal, wherein the circuit element has a reactance that changes with potential difference between the input terminal and the output terminal; and a voltage control circuit supplying a voltage to the input terminal of the circuit element so that the reactance of the circuit element decreases in response to an increase in potential of the gate, wherein a sum of the reactance of the circuit element and a gate-source reactance of the transistor remains substantially constant.”

66. Devices with transceivers, antenna modules, front-end modules (FEMs), and/or other components which incorporate the HG11-PG660-200 RF die meet every element of this claim.<sup>16</sup> The HG11-PG660-200 RF die contains a phase correction circuit for a transistor. For example, the transmitter portion of the HG11-PG660-200 RF die contains transistors with a phase correction circuit. For instance, a circuit element in the HG11-PG660-200 RF die (hereafter called “MOS-C”) forms part of a phase correction circuitry for a transistor in the HG11-PG660-200 RF die (hereafter called “MOS7”).

67. This phase correction circuit contains a circuit element having an output terminal connected to a gate of a transistor to which a control signal line is connected. For example, in the HG11-PG660-200 RF die, the circuit element MOS-C has an output terminal connected to a gate of the MOS7 transistor. It also has an input terminal.

68. A control signal line is also connected to the gate of the transistor. For example, a control signal line is connected to the gate of the MOS7 transistor through a passive bias network.

69. The circuit element has a reactance that changes with potential difference between the input terminal and the output terminal. For example, the identified MOS-C circuit element is an NMOS Field Effect Transistor whose source and drain are connected. MOS-C acts as a varactor whose capacitance (and thus reactance) changes according to the potential difference between the input terminal (drain and source node) and the output terminal (gate node).

70. This phase correction circuit in the HG11-PG660-200 RF die also contains a voltage control circuit supplying a voltage to the input terminal of the circuit element so that the reactance of the circuit element decreases in response to an increase in the potential of the gate. For example, another transistor in the HG11-PG660-200 RF die forms part of the voltage control

---

<sup>16</sup> This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which Apple’s products infringe the ’343 Patent.

circuit supplying a voltage to the input terminal of the circuit element MOS-C.

71. The reactance of the circuit element decreases in response to an increase in potential of the gate, wherein a sum of the reactance of the circuit element and a gate-source reactance of the transistor remains substantially constant. For example, when the magnitude of the gate-source potential at MOS7 increases, it leads to a reduction in the capacitance of the circuit element (MOS-C). As the gate potential of the MOS7 gets more negative (i.e., the magnitude of gate-source potential increases), the gate-source capacitance of transistor MOS7 increases. This increase is offset, however, by the decrease in the capacitance of the circuit element (MOS-C) that occurs due to the increase in the magnitude of the gate potential of MOS7 such that the sum of capacitance (i.e. reactance) of the circuit element (MOS-C) and transistor (MOS7) remains substantially constant.

72. Apple makes, uses, imports, offers for sale, and/or sells mobile devices, such as smartphones, that incorporate the HG11-PG660-200 RF die in their antenna modules, including but not limited to the iPhone 12, iPhone 12 Mini, iPhone 12 Pro, and iPhone 12 Pro Max.

73. Apple has imported and sold, and continues to sell and offer for sale, these infringing mobile devices in the United States, including through the Apple website (Apple.com) and at Apple stores in Austin and San Antonio, among other places in the Western District of Texas.

74. Apple committed and is committing the foregoing infringing activities without license from Arigna. Apple's acts of infringement have damaged Arigna, as owner and assignee of the '343 Patent. Arigna is entitled to recover from Apple the damages it has sustained as a result of Apple's wrongful acts in an amount subject to proof at trial. Apple's infringement of Arigna's rights under the '343 Patent is ongoing and will continue to damage Arigna.

75. Beginning no later than the filing of this Complaint, Apple has had actual knowledge of the '343 Patent. Apple's continued infringement following the filing of this Complaint, despite its knowledge of the '343 Patent and Arigna's infringement allegations, is intentional and deliberate and willful.

76. In addition, Apple indirectly infringed, and continues to indirectly infringe, the '343 Patent by actively inducing its infringement in violation 35 U.S.C. § 271(b).

77. Apple's authorized retailers, such as Best Buy, and wireless carriers, such as Verizon, directly infringe the '343 Patent by selling the accused Apple devices to consumers. Consumers directly infringe the '343 Patent by using the accused Apple devices.

78. Apple knowingly induced and induces these acts of infringement with the specific intent to encourage them by taking active steps to encourage and facilitate direct infringement by these third parties, in this District and elsewhere in the United States, through its manufacture and sale of the infringing products, and through its creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to the products with knowledge and the specific intent that its efforts will result in the direct infringement of the '343 Patent by these third parties.

79. Such active steps include, for example, advertising and marketing the infringing products to resellers, wireless carriers, and consumers, obtaining FCC approval for such devices to be utilized in the United States, and distributing and selling such devices to consumers and resellers knowing that they would be marketed, offered for sale, and used in the United States. Apple specifically advertises that the "iPhone 12, iPhone 12 mini, iPhone 12 Pro, and iPhone 12 Pro Max work with the 5G cellular networks of certain carriers."<sup>17</sup> Further, Apple's website

---

<sup>17</sup> Apple, *Use 5G with your iPhone* (accessed Sept. 8, 2021), available at: <https://support.apple.com/en-us/HT211828>.

informs consumers that “When you’re in an area with 5G coverage for your carrier and your 5G cellular plan has been activated, you’ll see a 5G icon in the status bar of your iPhone.”<sup>18</sup>

80. Apple user guides for the accused Apple products likewise induce infringement, instructing consumers about, among other things, how to “[s]et up cellular service on iPhone.”<sup>19</sup> By instructing third parties to turn on and use the accused products for infringing purposes, such as to make and receive calls using the products’ antenna modules, Apple knowingly induces these third parties to commit infringing acts.

81. In addition, Apple has indirectly infringed and continues to indirectly infringe the ’343 Patent as a contributory infringer in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, infringing products with knowledge that they are especially designed or adapted to operate in a manner that infringes the ’343 Patent and despite the fact that the infringing technology is not a staple article of commerce suitable for substantial non-infringing use. Apple knowingly incorporates antenna modules with the HG11-PG660-200 RF die into the accused Apple products such that they operate in an infringing manner. By incorporating such antenna modules into its products, Apple contributes to infringing use as consumers make and receive calls using the antennas of the accused products, which lack substantially non-infringing uses because the accused products are designed and manufactured to operate as phones in a manner that infringes the ’343 Patent.

**COUNT TWO**  
**INFRINGEMENT OF U.S. PATENT NO. 8,947,164**

82. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further states:

---

<sup>18</sup> *Id.*

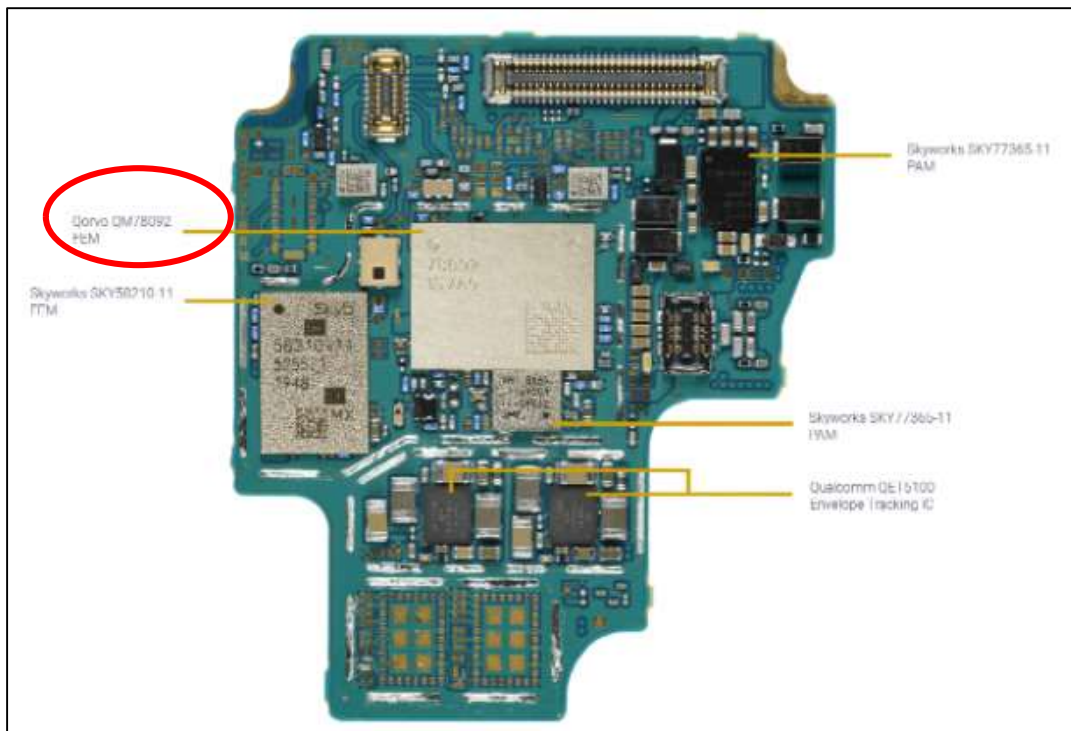
<sup>19</sup> iPhone User Guide, *Set up cellular service on iPhone* (accessed Sept. 8, 2021), available at: <https://support.apple.com/guide/iphone/set-up-cellular-service-iph3f11fba92/14.0/ios/14.0>.

### Samsung

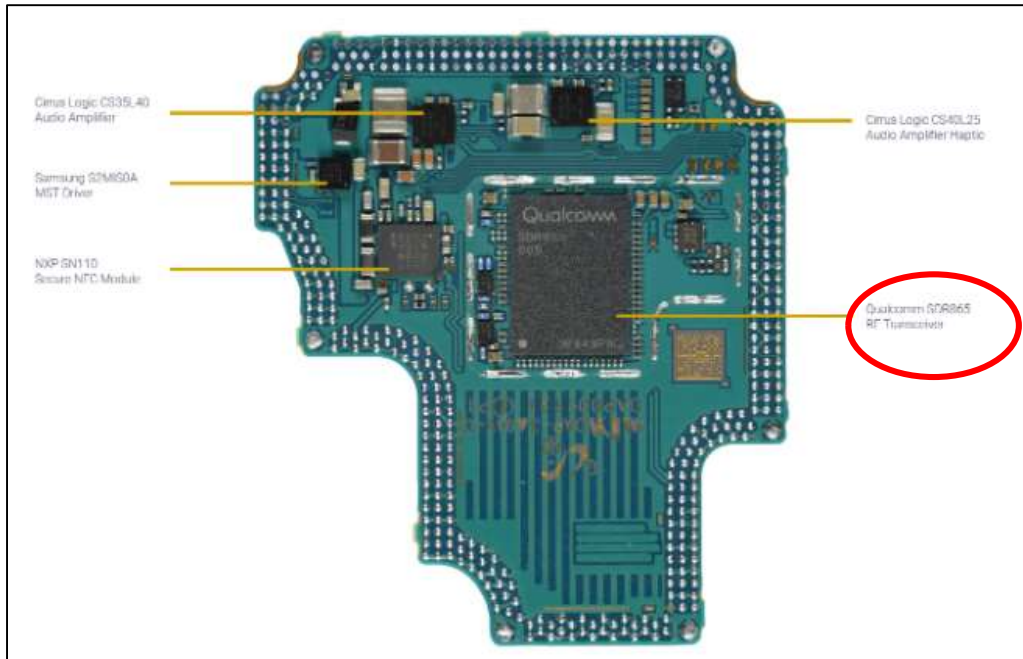
83. Samsung has infringed and continues to infringe at least claim 1 of the '164 Patent in violation of 35 U.S.C. § 271, either literally or through the doctrine of equivalents, by making, using, selling, or offering for sale in the United States, and/or importing into the United States, without authorization, products that practice at least claim 1 of the '164 Patent. Samsung is liable for its infringement of the '164 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

84. More specifically, Samsung designs, manufactures, assembles, imports, offers for sale, and/or sells mobile devices and computers that incorporate the Qualcomm SDR865 transceiver and Qorvo QM78092 front-end module, and/or other transceivers and front-end modules, which infringe at least independent claim 1 of the '164 Patent. For example, as shown in Figure 6, the SDR865 transceiver and QM78092 front-end module come preinstalled in certain Samsung mobile devices, including the Galaxy S20 Ultra 5G.

**FIGURE 6**







Source: Tech Insights, *Samsung Galaxy S20 Ultra 5G Teardown Analysis* (accessed Sept. 6, 2021), available at: <https://www.techinsights.com/blog/samsung-galaxy-s20-teardown-analysis>.

85. Claim 1 is illustrative of the '164 Patent. It recites “[a] power amplifier with power detection, comprising: a radio frequency (RF) power amplifier having a gain stage that includes a gain stage input, a gain stage output, and a feedback loop coupled between an input and an output of the power amplifier; a detection circuit having a first detection circuit input electrically coupled to the gain stage input and having a detection circuit output; an amplitude control circuit and a phase control circuit electrically coupled together in series between the gain stage output and a second detection circuit input; wherein the amplitude control circuit and the phase control circuit produce a signal received by the second detection circuit input so that the detection circuit detects a signal at the output of the detection circuit that has a power proportional to a forward power output of the power amplifier.”

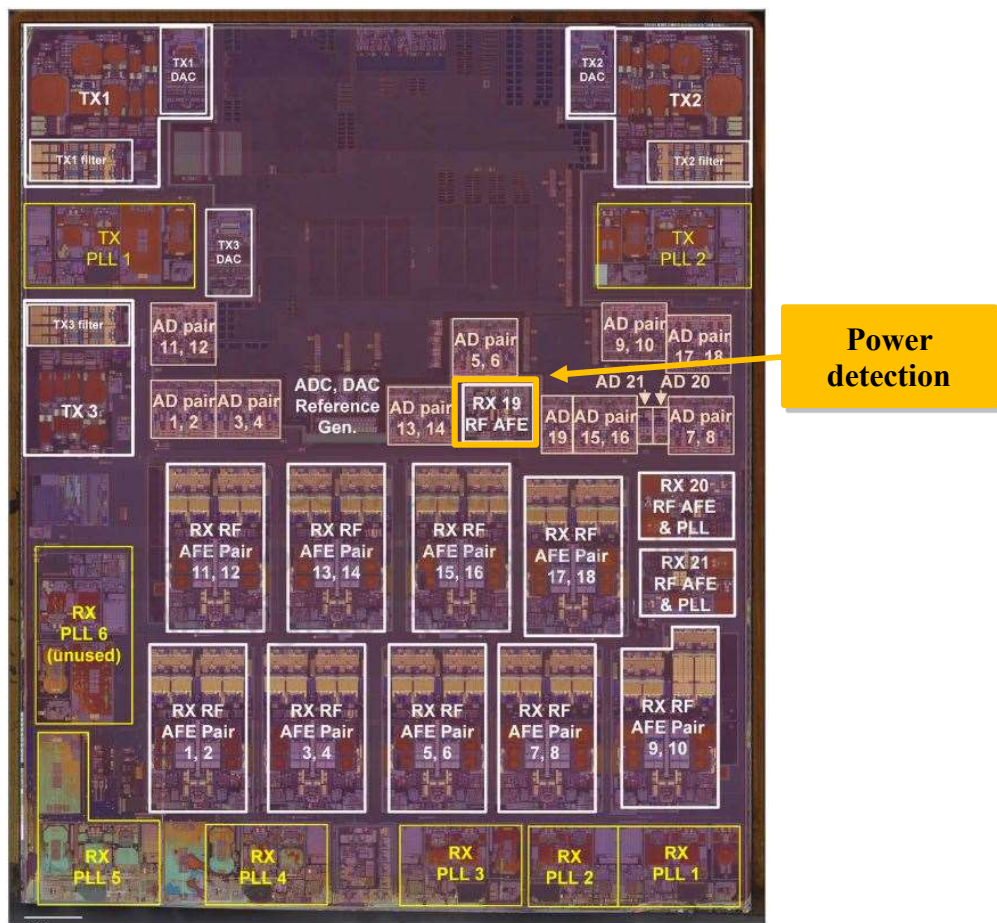
86. The SDR865 transceiver and QM78092 front-end module, as installed in various



Samsung products, meet every element of this claim.<sup>20</sup>

87. A power amplifier is present in the QM78092 with power detection provided by the SDR865. For example, the RX19 RF AFE identified in Figure 7 is part of a feedback receiver in the SDR865 that carries out a power detection function.

**FIGURE 7**



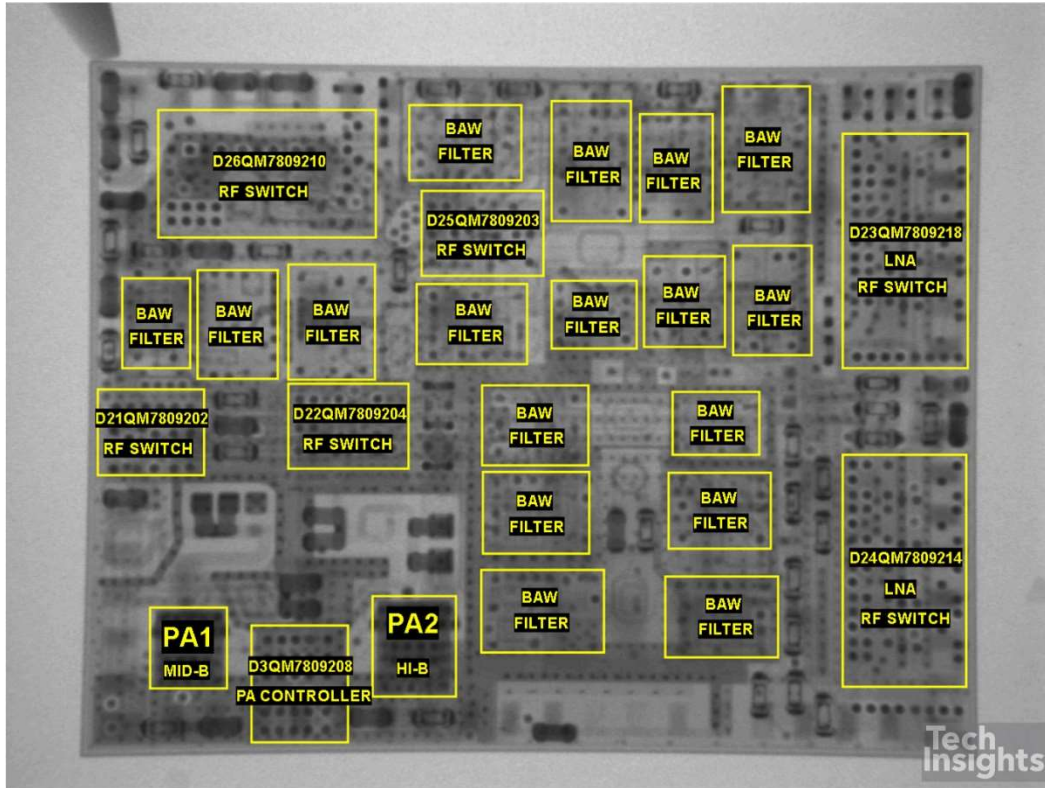
*Source:* Tech Insights, *Analysis of Qualcomm's Snapdragon SDR865 Transceiver* (accessed Sept. 6, 2021) available at: <https://www.techinsights.com/blog/analysis-qualcomms-snapdragon-sdr865-transceiver-supporting-5g-sub-6-ghz-and-lte-services>

88. The QM78092 contains a radio frequency (RF) power amplifier having a gain stage that includes a gain stage input and a gain stage output. On information and belief, a feedback loop

<sup>20</sup> This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which Samsung's products infringe the '164 Patent.

is coupled between an input and an output of the power amplifier. Figure 8 shows power amplifiers (PAs) in the QM78092.

**FIGURE 8**



Source: Tech Insights, Qorvo, QM78092 (accessed Sept. 6, 2021) available at: <https://www.techinsights.com/products/mar-2012-201>

89. The SDR865 contains a detection circuit having a first detection circuit input electrically coupled to the gain stage input and having a detection circuit output. For example, the gain stage input of the power amplifier in the QM78092 is electrically coupled to a first detection circuit input in the SDR865. For instance, in the Samsung Galaxy S20 5G, TXRFPAD[12 and 15] on the first detection circuit in the SDR865 is electrically coupled to the gain stage input of the power amplifier in QM78092.

90. The SDR865 and QM78092 also contain an amplitude control circuit and a phase control circuit electrically coupled together in series between the gain stage output and a second

detection circuit input. The phase control circuit consists of an inductor and a capacitor in series with a low noise amplifier acting as an amplitude control circuit.

91. The amplitude control circuit and the phase control circuit produce a signal received by the second detection circuit input so that the detection circuit detects a signal at the output of the detection circuit that has a power proportional to a forward power output of the power amplifier. For example, the amplitude and phase control circuit produce a signal that is received into the mixer of the detection circuit (second input). The mixer also receives a LO signal (first input) and the result is used to estimate the forward power output of the power amplifier in the front-end module.

92. Samsung makes, uses, imports, offers for sale, and/or sells mobile devices and computers that incorporate the combination of SDR865 and QM78092 components, including but not limited to the Samsung Galaxy S20 5G, Samsung Galaxy S20+ 5G, and Samsung Galaxy S20 Ultra 5G.

93. Samsung also makes, uses, imports, offers for sale, and/or sells mobile devices and computers that incorporate the Qualcomm SDR868 transceiver and Qorvo QM78217 front-end module, including but not limited to the Samsung Galaxy S21 5G, Samsung Galaxy S21+ 5G, and Samsung Galaxy S21 Ultra 5G, which infringe claim 1 of the '164 Patent in a manner substantially similar to the mobile devices and computers that incorporate the SDR865 transceiver and QM78092 front-end module.

94. A power amplifier is present in the QM78217 front-end module with power detection provided by the SDR868. Similar to the SDR865, the RX19 RF AFE in the SDR868 is part of a feedback receiver that carries out a power detection function.

95. The QM78217 contains a radio frequency (RF) power amplifier having a gain stage

that includes a gain stage input and a gain stage output. On information and belief, a feedback loop is coupled between an input and an output of the power amplifier.

96. The SDR868 contains a detection circuit, which has a first detection circuit input electrically coupled to the gain stage input and having a detection circuit output. For example, the gain stage input of the power amplifier in the QM78217 is electrically coupled to a first detection circuit input in the SDR868. For instance, in the Samsung Galaxy S21 Ultra 5G, TXRFPAD(7) on the first detection circuit in the SDR868 is electrically coupled to the gain stage input of the power amplifier in QM78217.

97. The SDR868 and QM78217 also contain an amplitude control circuit and a phase control circuit electrically coupled together in series between the gain stage output and a second detection circuit input. The phase control circuit consists of an inductor and a capacitor in series with a low noise amplifier acting as an amplitude control circuit.

98. The amplitude control circuit and the phase control circuit produce a signal received by the second detection circuit input so that the detection circuit detects a signal at the output of the detection circuit that has a power proportional to a forward power output of the power amplifier. For example, the amplitude and phase control circuit produce a signal that is received into the mixer of the detection circuit (second input). The mixer also receives a LO signal (first input) and the result is used to estimate the forward power output of the power amplifier in the front-end module.

99. Samsung has imported and sold, and continues to sell and offer for sale, these infringing mobile devices and computers in the United States, including through Samsung websites (Samsung.com) and Samsung authorized retailers in the Western District of Texas.

100. Samsung committed and is committing the foregoing infringing activities without

license from Arigna. Samsung's acts of infringement have damaged Arigna, as owner and assignee of the '164 Patent. Arigna is entitled to recover from Samsung the damages it has sustained as a result of Samsung's wrongful acts in an amount subject to proof at trial. Samsung's infringement of Arigna's rights under the '164 Patent is ongoing and will continue to damage Arigna.

101. Beginning no later than the filing of this Complaint, Samsung has had actual knowledge of the '164 Patent. Samsung's continued infringement following the filing of this Complaint, despite its knowledge of the '164 Patent and Arigna's infringement allegations, is intentional and deliberate and willful.

102. In addition, Samsung indirectly infringed, and continues to indirectly infringe, the '164 Patent by actively inducing its infringement in violation 35 U.S.C. § 271(b).

103. Samsung's authorized retailers, such as Best Buy, and wireless carriers, such as Verizon, directly infringe the '164 Patent by selling the accused Samsung devices to consumers. Consumers directly infringe the '164 Patent by using the accused Samsung devices.

104. Samsung knowingly induced and induces these acts of infringement with the specific intent to encourage them by taking active steps to encourage and facilitate direct infringement by these third parties, in this District and elsewhere in the United States, through its manufacture and sale of the infringing products, and through its creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to the products with knowledge and the specific intent that its efforts will result in the direct infringement of the '164 Patent by these third parties.

105. Such active steps include, for example, advertising and marketing the infringing products to resellers, wireless carriers, and consumers, obtaining FCC approval for such devices to be utilized in the United States, and distributing and selling such devices to consumers and

resellers knowing that they would be marketed, offered for sale, and used in the United States. Samsung user guides for the accused Samsung products facilitate infringement, instructing consumers about, among other things, how to “turn your device on.”<sup>21</sup> By instructing third parties to turn on and use the accused products, Samsung knowingly induces these third parties to commit infringing acts as the power detection functions of the infringing products operate.

106. In addition, Samsung has indirectly infringed and continues to indirectly infringe the '164 Patent as a contributory infringer in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, infringing products with knowledge that they are especially designed or adapted to operate in a manner that infringes the '164 Patent and despite the fact that the infringing technology is not a staple article of commerce suitable for substantial non-infringing use. Samsung knowingly incorporates specific transceivers and front-end modules into the accused products such that they operate in an infringing manner. By incorporating such devices into its products, Samsung contributes to infringing use as consumers turn on and use the accused products, which lack substantially non-infringing uses because the accused products are designed and manufactured to operate in a powered-on mode that infringes the '164 Patent.

### Apple

107. Apple has infringed and continues to infringe at least claim 1 of the '164 Patent in violation of 35 U.S.C. § 271, either literally or through the doctrine of equivalents, by making, using, selling, or offering for sale in the United States, and/or importing into the United States, without authorization, products that practice at least claim 1 of the '164 Patent. Apple is liable for its infringement of the '164 Patent pursuant to 35 U.S.C. § 271(a), (b), and (c).

---

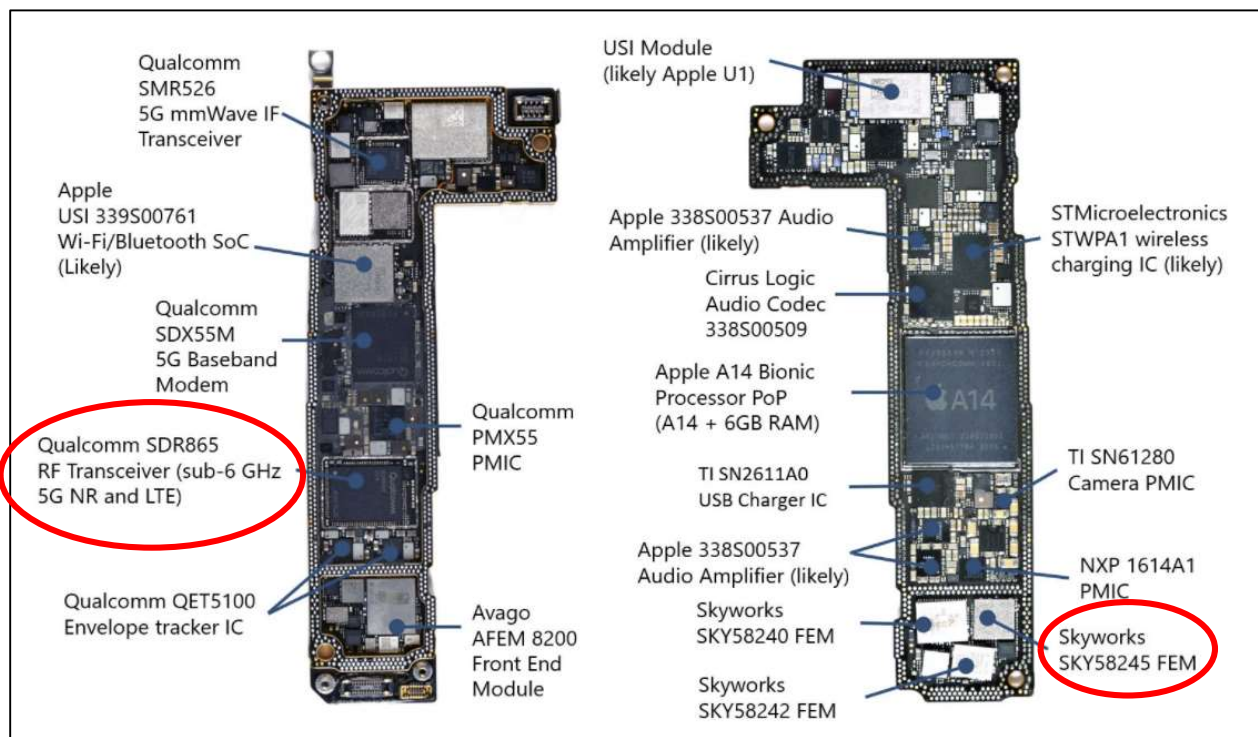
<sup>21</sup> Samsung Galaxy S21 5G User Manual.



108. More specifically, Apple designs, manufactures, assembles, imports, offers for sale, and/or sells mobile devices that incorporate the Qualcomm SDR865 transceiver and Skyworks SKY58245-19 front-end module, and/or other components, which infringe at least independent claim 1 of the '164 Patent.

109. For example, the SDR865 transceiver and SKY58245-19 front-end module come preinstalled in certain Apple mobile devices, including the iPhone 12 Pro, as shown in Figure 9.

**FIGURE 9**



Source: United Lex, *Apple iPhone 12 Pro 5G mmWave Report* (accessed Sept. 6, 2021), available at: <https://unitedlex.com/insights/apple-iphone-12-pro-5g-mmwave-report>.

110. Claim 1 is illustrative of the '164 Patent. It recites “[a] power amplifier with power detection, comprising: a radio frequency (RF) power amplifier having a gain stage that includes a gain stage input, a gain stage output, and a feedback loop coupled between an input and an output of the power amplifier; a detection circuit having a first detection circuit input electrically coupled

to the gain stage input and having a detection circuit output; an amplitude control circuit and a phase control circuit electrically coupled together in series between the gain stage output and a second detection circuit input; wherein the amplitude control circuit and the phase control circuit produce a signal received by the second detection circuit input so that the detection circuit detects a signal at the output of the detection circuit that has a power proportional to a forward power output of the power amplifier.”

111. The SDR865 transceiver and SKY58245-19 front-end module, as installed in various Apple products, meet every element of this claim.<sup>22</sup>

112. A power amplifier is present in the SKY58245-19 with power detection provided by the SDR865. For example, the RX19 RF AFE identified in Figure 7 above is part of a feedback receiver in the SDR865 that carries out a power detection function.

113. The SKY58245-19 front-end module contains a radio frequency (RF) power amplifier having a gain stage that includes a gain stage input and a gain stage output. On information and belief, a feedback loop is coupled between an input and an output of the power amplifier.

114. The SDR865 contains a detection circuit, which has a first detection circuit input electrically coupled to the gain stage input and having a detection circuit output. For example, the gain stage input of the power amplifier in the SKY58245-19 is electrically coupled to a first detection circuit input in the SDR865. For instance, in the Apple iPhone 12 Pro Max, TXRFPAD(7) and TXRFPAD(8) on the first detection circuit in the SDR865 are electrically coupled to the gain stage input of the power amplifier in the SKY58245-19.

115. The SDR865 and SKY58245-19 also contain an amplitude control circuit and a

---

<sup>22</sup> This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which Apple’s products infringe the ’164 Patent.



phase control circuit electrically coupled together in series between the gain stage output and a second detection circuit input. The phase control circuit consists of an inductor and a capacitor in series with a low noise amplifier acting as an amplitude control circuit.

116. The amplitude control circuit and the phase control circuit produce a signal received by the second detection circuit input so that the detection circuit detects a signal at the output of the detection circuit that has a power proportional to a forward power output of the power amplifier. For example, the amplitude and phase control circuit produce a signal that is received into the mixer of the detection circuit (second input). The mixer also receives a LO signal (first input) and the result is used to estimate the forward power output of the power amplifier in the front-end module.

117. Apple makes, uses, imports, offers for sale, and/or sells mobile devices that incorporate the combination of SDR865 and SKY58245-19 components, including but not limited to the iPhone 12, iPhone 12 Mini, iPhone 12 Pro, and iPhone 12 Pro Max.

118. Apple has imported and sold, and continues to sell and offer for sale, these infringing mobile devices in the United States, including through the Apple website (Apple.com) and at Apple stores in Austin and San Antonio, among other places in the Western District of Texas.

119. Apple committed and is committing the foregoing infringing activities without license from Arigna. Apple's acts of infringement have damaged Arigna, as owner and assignee of the '164 Patent. Arigna is entitled to recover from Apple the damages it has sustained as a result of Apple's wrongful acts in an amount subject to proof at trial. Apple's infringement of Arigna's rights under the '164 Patent will continue to damage Arigna.

120. Beginning no later than the filing of this Complaint, Apple has had actual

knowledge of the '164 Patent. Apple's continued infringement following the filing of this Complaint, despite its knowledge of the '164 Patent and Arigna's infringement allegations, is intentional and deliberate and willful.

121. In addition, Apple indirectly infringed, and continues to indirectly infringe, the '164 Patent by actively inducing its infringement in violation 35 U.S.C. § 271(b).

122. Apple's authorized retailers, such as Best Buy, and wireless carriers, such as Verizon, directly infringe the '164 Patent by selling the accused Apple devices to consumers. Consumers directly infringe the '164 Patent by using the accused Apple devices.

123. Apple knowingly induced and induces these acts of infringement with the specific intent to encourage them by taking active steps to encourage and facilitate direct infringement by these third parties, in this District and elsewhere in the United States, through its manufacture and sale of the infringing products, and through its creation and dissemination of promotional and marketing materials, supporting materials, instructions, product manuals, and/or technical information relating to the products with knowledge and the specific intent that its efforts will result in the direct infringement of the '164 Patent by these third parties.

124. Such active steps include, for example, advertising and marketing the infringing products to resellers, wireless carriers, and consumers, obtaining FCC approval for such devices to be utilized in the United States, and distributing and selling such devices to consumers and resellers knowing that they would be marketed, offered for sale, and used in the United States. Apple user guides for the accused products facilitate infringement, instructing consumers about, among other things, "how to turn your iPhone off, then back on."<sup>23</sup> By instructing third parties to turn on and use the accused products and power components, Apple knowingly induces these third

---

<sup>23</sup> Apple Support, *Restart your iPhone* (accessed Sept. 8, 2021), available at: <https://support.apple.com/en-us/HT201559>.

parties to commit infringing acts as the power detection functions of the infringing products operate.

125. In addition, Apple has indirectly infringed and continues to indirectly infringe the '164 Patent as a contributory infringer in violation of 35 U.S.C. § 271(c) by selling or offering to sell in the United States, or importing into the United States, infringing products with knowledge that they are especially designed or adapted to operate in a manner that infringes the '164 Patent and despite the fact that the infringing technology is not a staple article of commerce suitable for substantial non-infringing use. Apple knowingly incorporates specific transceivers and front-end modules into the accused products such that they operate in an infringing manner. By incorporating such devices into its products, Apple contributes to infringing use as consumers turn on and use the accused products and power components, which lack substantially non-infringing uses because the accused products are designed and manufactured to operate in a powered-on mode that infringes the '164 Patent.

#### **DEMAND FOR JURY TRIAL**

126. Plaintiff Arigna hereby demands a jury trial for all issues so triable.

#### **PRAYER FOR RELIEF**

WHEREFORE, Plaintiff Arigna Technology Limited requests entry of judgment in its favor and against Defendants Samsung and Apple as follows:

- A. Declaring that Defendants Samsung and Apple have each infringed United States Patent No. 6,603,343;
- B. Declaring that Defendants Samsung and Apple have each infringed United States Patent No. 8,947,164;
- C. Declaring that Samsung's and Apple's infringement of United States Patent No.

- 6,603,343 has been willful and deliberate, at least from the filing of this Complaint;
- D. Declaring that Samsung's and Apple's infringement of United States Patent No. 8,947,164 has been willful and deliberate, at least from the filing of this Complaint;
- E. Awarding damages to Plaintiff in an amount no less than a reasonable royalty for each Defendant's infringement of United States Patent No. 6,603,343 and United States Patent No. 8,947,164, together with treble damages for willful infringement, prejudgment and post-judgment interest, and costs as permitted under 35 U.S.C. § 284;
- F. Awarding attorneys' fees pursuant to 35 U.S.C. § 285 or as otherwise permitted by law;
- G. Ordering Defendants to pay supplemental damages to Arigna, including any ongoing royalties and interest, with an accounting, as needed; and
- H. Awarding such other costs and further relief as the Court may deem just and proper.

Dated: September 10, 2021

Respectfully submitted,

/s/ Charles L. Ainsworth

Charles L. Ainsworth (Texas 00783521)  
Robert Christopher Bunt (Texas 00787165)  
PARKER, BUNT & AINSWORTH, P.C.  
100 East Ferguson, Suite 418  
Tyler, Texas 75702  
Tel: (903) 531-3535  
Email: [charley@pbatyler.com](mailto:charley@pbatyler.com)  
Email: [rcbunt@pbatyler.com](mailto:rcbunt@pbatyler.com)

Matthew R. Berry  
Andres Healy  
John E. Schiltz (*pro hac vice* forthcoming)  
Kemper Diehl (*pro hac vice* forthcoming)  
SUSMAN GODFREY L.L.P.  
1201 Third Avenue, Suite 3800  
Seattle, TX 98101-3000  
Tel: (206) 516-3880  
Fax: (206) 516-3883  
Email: [mberry@susmangodfrey.com](mailto:mberry@susmangodfrey.com)

Email: [ahealy@susmangodfrey.com](mailto:ahealy@susmangodfrey.com)

Email: [jschiltz@susmangodfrey.com](mailto:jschiltz@susmangodfrey.com)

Email: [kdiehl@susmangodfrey.com](mailto:kdiehl@susmangodfrey.com)

*Attorneys for Arigna Technology Limited*